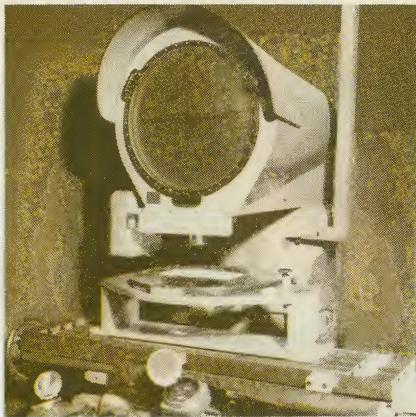


Whose printed circuits are known everywhere for



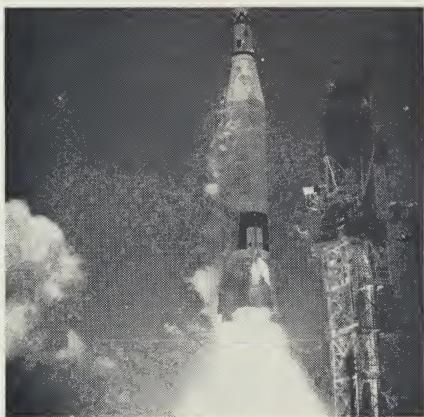
Craftsmanship



Quality Control



Value



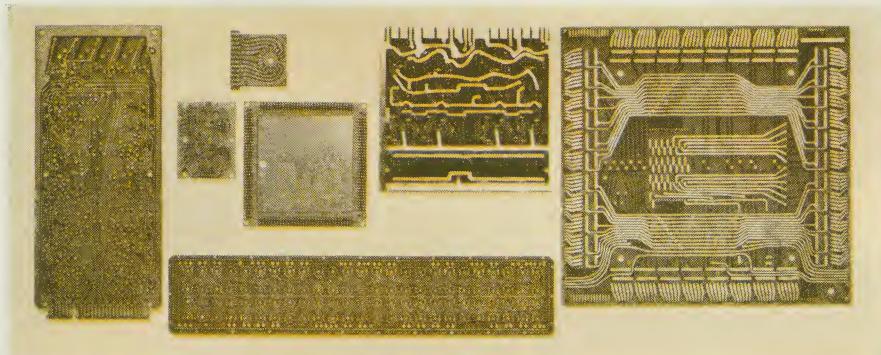
Applications



Reliability



Multilayer



boards to meet everyone's requirements?

Precision-programmed automation plus personal craftsmanship go into every Cinch-Graphik board. That's why we can meet or exceed your specifications, MIL or commercial, in any application—multilayer, subminiature, thin-film, and other high-density techniques. Send us your requirements today. Or, write for our general brochure.

**CINCH-
GRAPHIK**

PRINTED CIRCUITS

Of course!



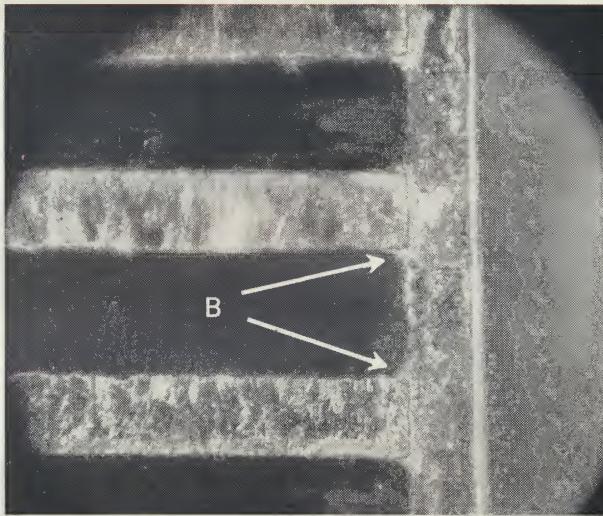
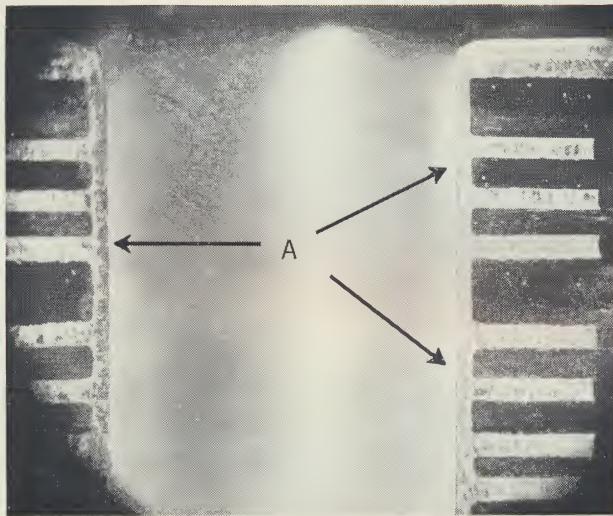
CINCH-GRAPHIK

Division of United-Carr Fastener Corporation

200 South Turnbull Canyon Road, City of Industry (Los Angeles), California • Phone (Area Code 213) ED 3-1201.
Offices in 22 Principal Cities throughout United States, Canada, England and Australia listed under Cinch Mfg. Co.
or United-Carr Fastener Corporation • Cinch • Cinch-Monadnock • Howard B. Jones • Ucinite • Palnut

As Advertised in AVIATION WEEK & SPACE TECHNOLOGY, February 10, 1964

These Specifications show why CINCH-GRAPHIK leads the Industry in Multilayer Circuitry



These potted cross-section microphotos (approx. 60x and 215x) demonstrate CINCH-GRAPHIK's superior multilayer characteristics. (A) High density, uniform wall thickness throughout the entire length of the hole. (B) High reliability, full contact interface connection between individual layers and the plated wall.

MATERIAL: Epoxy glass type GE per MIL-P-13949B. Insulation between layers shall be a minimum of .004. Greater thickness may be acquired depending upon cost requirement.

COPPER FOIL: Copper may be one ounce or two ounce per MIL-P-13949B § 3.2.1 and § 6.2c.

THICKNESS: Finished board thickness per MIL-P-13949B § 3.2.2 Table I Class I. Depending upon total thickness and number of layers, a closer tolerance of $\pm .005$ can be held.

WARP AND TWIST: The finished board shall not exceed 1% warp or twist. Measurement shall be made in accordance with Federal Spec. LP406.

UNIFORMITY: All laminated boards of corresponding thickness and/or lot will be of uniform texture, finish and specified properties.

INSULATION: Resistance between any two conductors shall not be less than 50,000 megohms with 100 volts D.C. applied for one minute.

DIELECTRIC VOLTAGE: Minimum dielectric withstanding voltage between two conductors shall be 1000 volts A.C. peak or D.C., applied for one minute.

DIELECTRIC CONSTANT: Average, maximum at one megacycle, 5.8.

ENVIRONMENTAL: During a continuous four hour test at $+150 \pm 5^\circ\text{C}$ no evidence of blistering, delamination or other deterioration shall occur.

SOLDERABILITY: Shall be capable of withstanding a dip or wave soldering operation of a maximum of 10 seconds ± 1 second at a temperature of $500 \pm 5^\circ\text{F}$ with no evidence of blistering, delamination or other deterioration.

RESOLDERABILITY: Shall be capable of withstanding the removal and replacement of any individual module for a minimum of ten heating operations with no harmful effects when using a 371/2 watt soldering iron and exercising reasonable care.

REGISTRATION: Registration of layers, pattern to board outline, or layer to layer shall be $\pm .005$ from true center or true location.

DRILLING: All holes shall be $\pm .003$ from true center when using the artwork as a guide or from grid location when using a coordinate system.

CONDUCTOR WIDTH: Minimum nominal conductor width on inner layers .008 and .012 on outer layers. Tolerances: $\pm .002$ on inner layers and $\pm .004$ on outer layers.

HOLE SIZE: Minimum finished hole size .018 with a ratio of 33% hole diameter to thickness of finished board. Hole tolerance $\pm .003$.

PLATING MATERIAL THICKNESS:

Copper	.001 min.
Gold	.0001 min.
Tin-Lead	.0005 min.

When specified, the boards can be nickel-gold plated.

REV. JUNE '63

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As Advertised in AVIATION WEEK & SPACE TECHNOLOGY, March 9, 1964